



I-81/Halfway Boulevard Freight Connection

MAKING WAY FOR ECONOMIC GROWTH AND SAFETY PROJECT

INFRA APPLICATION ■ RURAL

Sponsored By:



Washington County

M A R Y L A N D

In Cooperation With:



APPLICATION TABLE

PROJECT NAME		I-81/HALFWAY BOULEVARD FREIGHT CONNECTION: MAKING WAY FOR ECONOMIC GROWTH AND SAFETY PROJECT
Project Sponsor		Washington County, MD
Was an INFRA application for this project submitted previously? If yes, please include title.		Yes (similar project): Interstate 81 Corridor Widening: Improving Safety, Capacity, and Reliability in Western Maryland.
PROJECT COSTS		
INFRA Request Amount		\$55,000,000
Estimated Federal Funding (excluding INFRA)		\$3,800,000
Estimated Non-Federal Funding		\$47,122,000
Future Eligible Project Cost (sum of previous three rows)		\$105,922,000
Previously Incurred Project Cost (if applicable)		\$0
Total Project Cost (sum of 'Previously Incurred' and 'Future Eligible')		\$105,922,000
Are matching funds restricted to a specific project component? If so, which one?		\$3,800,000 in ARC funds, \$2,172,000 in County funds, and \$1,350,000 in Private funds are dedicated to the Halfway Boulevard component. \$42,600,000 in State funds and \$1,000,000 in County funds are dedicated to the I-81 component.
PROJECT ELIGIBILITY		
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on the National Highway Freight Network (NHFN)?		\$105,922,000 (100 percent)
Approximately how much of the estimated future eligible project costs will be spent on components of the project currently located on the National Highway System (NHS)?		\$105,922,000 (100 percent)
Approximately how much of the estimated future eligible project costs will be spent on components constituting railway-highway grade crossing or grade separation projects?		\$0
Approximately how much of the estimated future eligible project costs will be spent on components constituting intermodal or freight rail projects, or freight projects within the boundaries of a public or private freight rail, water (including ports), or intermodal facility?		\$0
PROJECT LOCATION		
State(s) in Which Project is Located		Maryland
Small or Large Project		Large Project
Urbanized Area in Which Project is Located (if applicable)		INFRA Designation: Rural The Project is located within the Hagerstown MD-WV-PA UZA, population 182,696 in the 2010 US Census.
IS THE PROJECT CURRENTLY PROGRAMMED IN THE...		
TIP?		Yes; HEPMPO Transportation Improvement Program (TIP)
STIP?		Yes; MDOT 2017 Statewide Transportation Improvement Program (STIP)
MPO Long Range Transportation Plan?		Yes; HEPMPO 2045 Long Range Transportation Plan
State Long Range Transportation Plan?		Yes; MDOT 2040 Maryland State Transportation Plan
State Freight Plan?		Yes; Maryland Strategic Goods Movement Plan

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EXECUTIVE SUMMARY

Washington County, Maryland seeks a \$55 million INFRA grant for a Project to improve connectivity, safety, and traffic flow on the National Freight Highway Network near Hagerstown, Maryland. State and local efforts to complete this long-awaited Project have generated a package of \$47.122 million in non-Federal funding, including over \$3 million in County funding and \$1.35 million in Private investment. This Project is part of a multistate effort to widen I-81 and provide a vital local highway link on Halfway Boulevard to better connect two major Interstates, which together will improve freight and personal transportation, supporting economic development in Western Maryland and throughout the Appalachian Region.

The **I-81/Halfway Boulevard Freight Connection: Making Way for Economic Growth and Safety Project** (the Project) includes two components: a much-needed widening and upgrade of a 3.5-mile section of I-81 originally built in the 1960s, and a 0.53-mile Extension of Halfway Boulevard to enhance capacity and better connect Interstate interchanges on I-81 and I-70.

The Project improves ramp and merge lane configurations for three interchanges on this segment of I-81, including the critical I-70/I-81 interchange. In addition to improving traffic operations, the Project improvements are expected to dramatically reduce the crash rate on a segment of I-81 marked by high truck traffic levels and a troubling safety history.

This Project represents a critical investment in one of the most heavily utilized freight corridors in the United States. Only four lanes wide, the Maryland segment of I-81 carries some of the highest freight volumes in the nation by lane mile, falling within the top one percent of all freight corridors. I-81 in the Project area today carries over 77,000 vehicles daily, more than 27 percent of which are trucks. Travel on I-81 and I-70 today accounts for 50 percent of the vehicle miles traveled (VMT) in Washington County. This traffic is expected to grow, with an estimated 70 percent increase in freight tonnage over the next two to three decades, and a 55 percent increase in traffic.

“These improvements to I-81 are critical infrastructure investments that will help citizens here in Washington County, across Western Maryland, and all across our State go about their daily lives in a faster, more efficient, and safer manner.”

Governor Larry Hogan
State of Maryland

With two major Interstate freight corridors meeting near Halfway Boulevard and an active CSX rail line nearby, the Project area is a growing center of warehouse and distribution facilities (including FedEx, Staples, Lenox, and Sealy), as well as truck repair and service businesses, including Freightliner and two Pilot Travel Centers. The Project provides significant benefits for national freight movements, as well as for local travel and economic development.

Truck traffic on I-81 near Halfway Boulevard exceeds 27 percent. The high volume of truck traffic – nearly twice the level the roads were designed for – exacerbates the weaving, merge, and diverge problems associated with the closely-spaced interchanges, contributing to the high and rising crash rate on I-81. The truck-involved crash and fatality rates along I-81 in Maryland are twice

as high as the statewide averages for similar roadways. These crashes result in hours of backlog congestion that impact freight deliveries all along the I-81 corridor, and bring disruptive levels of through-traffic onto local roads.

Benefits of the Project include:

- Reduction in the high crash rate on I-81
- Reduced travel delay
- More reliable travel times
- Improved connectivity and resiliency of the road network
- Enhanced access to a major freight distribution center, improving economic competitiveness
- Local economic development

PROJECT DESCRIPTION

The **I-81/Halfway Boulevard Freight Connection Project** has two components:

- **I-81 Phase 2:** Widening and modernizing 3.5 miles of I-81, including upgrades to interchanges at US Route 11 (US 11), I-70, and Halfway Boulevard.
- **Halfway Boulevard Extension:** A 4-lane, 0.55-mile divided highway Extension of Halfway Boulevard to meet Maryland State Route 63 (MD 63) approximately 0.4 miles north of its interchange with I-70.

The Project will provide substantial safety, capacity, and operational benefits for traffic on I-81, improve connectivity for regional truck trips, and provide resiliency by creating a new connection between I-81 and I-70 to maintain traffic flow in case of delay or closures due to daily traffic, construction, or a crash near the existing I-81/I-70 interchange. The Project will also address identified deficiencies on I-81, including substandard interchange ramp configurations and insufficient merge lanes.

This Project will significantly benefit freight. I-81, I-70, and Halfway Boulevard are each on the National Highway Freight Network (NHFN), critical to both local and regional truck travel. I-81 is part of the Primary Highway Freight System (PHFS), which includes the most critical highway portions of the US freight transportation system. Halfway Boulevard is designated as a Critical Urban Freight Corridor, a subsystem of the NHFN that includes public roads in urbanized areas that provide access and connection to the PHFS. A CSX railroad line runs through the Project area, with connections to businesses on and near Halfway Boulevard, making this Project beneficial to distribution centers and other businesses that utilize rail services.

A wide range of freight distribution and truck services are located along Halfway Boulevard and more are planned, including a new 170-space truck parking facility for overnight truck/trailer parking being constructed adjacent to a Pilot Travel Center. The truck services demonstrates how important this area is for freight, with tens of thousands of though trips daily, as well as substantial locally-generated Interstate truck trips.

While no specific physical improvements are being made to I-70, the segment between MD 63 and I-81 is expected to benefit from the Project. The Extension of Halfway Boulevard to meet MD 63 will enable trucks originating on Halfway Boulevard to access I-70 west without having to first travel east to I-81, potentially reducing the mileage traveled on I-70. The Extension will similarly provide easier access for trucks coming to the Project area on I-70 from the west. In addition to this connectivity benefit, the Halfway Boulevard Extension will also serve as an important alternate route during times when crashes block traffic on this part of I-70.

I.A PROJECT SCOPE OF WORK

The two components of the Project are described individually below and depicted in Figure 1 on the next page:

I-81 Phase 2 Widening:

- Reconstruct and improve interchanges along 3.5 miles of I-81 in Maryland from 2,000 feet north of MD 63/MD 68 to 1,000 feet north of Halfway Boulevard.
- Expand the Interstate from four to six through lanes with construction of two new travel lanes (one southbound and one northbound).
- Improve interchanges at the three Interstate exits within Project limits: the US 11 interchange in Williamsport, and the interchanges at I-70 and Halfway Boulevard southwest of Hagerstown.
- Install traffic control upgrades.
- Implement stormwater management improvements and install noise barriers as required.

Halfway Boulevard Extension:

- Extend Halfway Boulevard 2,800 feet (0.53 miles) westward from existing endpoint near New Gate Boulevard to meet MD 63.
- Create a four-lane divided roadway, designed with a thick pavement section and wide turn radii to handle the expected heavy truck traffic.

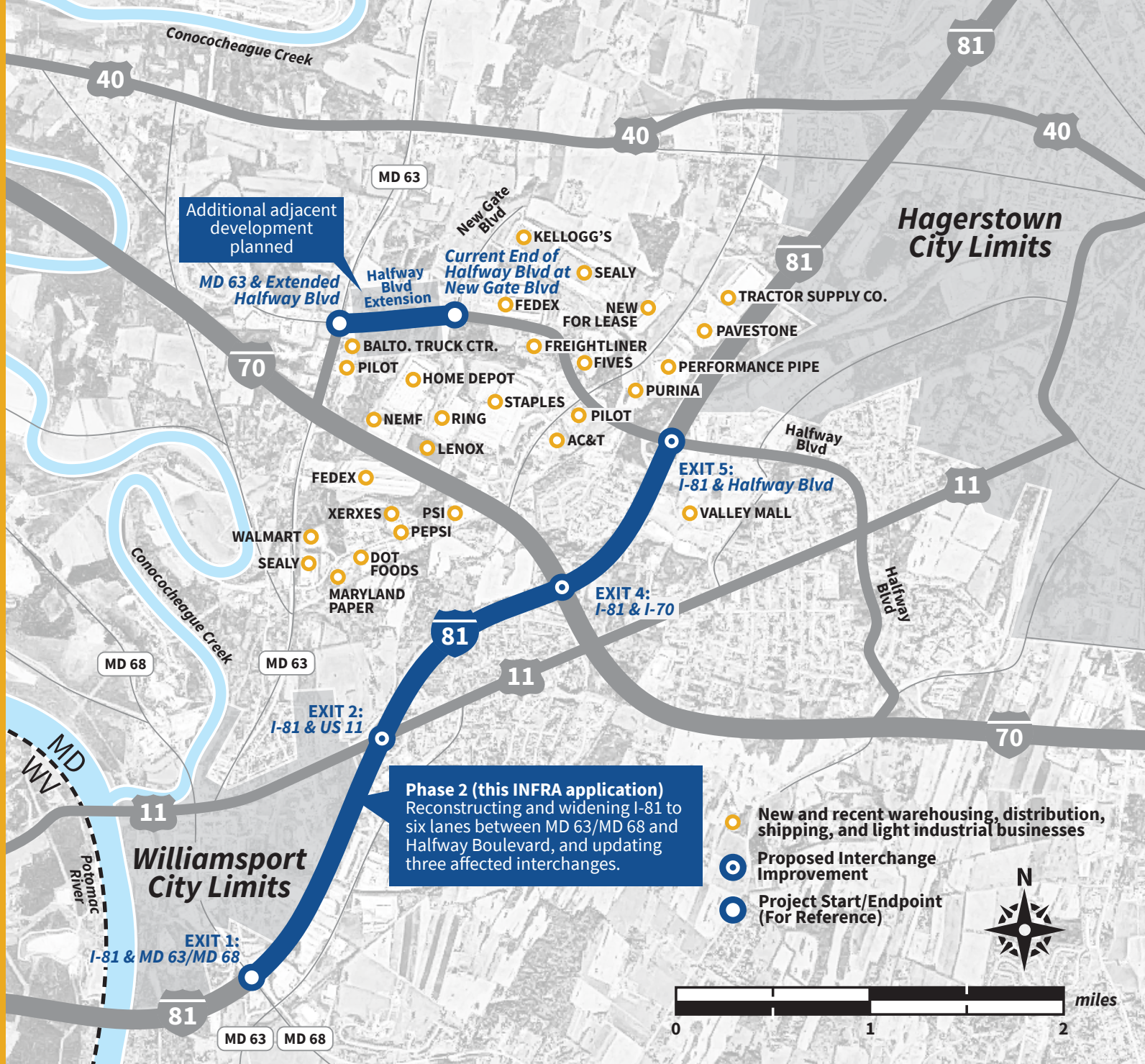


FIGURE 1 (ABOVE):

A map of the Project area, showing the I-81 widening and reconstruction and the Halfway Boulevard Extension in blue. New and recent warehousing and distribution businesses in the area are shown in yellow.

I.B CONTEXT AND REGIONAL SIGNIFICANCE

Washington County is in the eastern panhandle of Maryland, bordering Pennsylvania, Virginia, and West Virginia. The improvements brought by this Project affect two Interstate corridors, I-81 and I-70, and thus provide benefits to freight travel across a multistate region, as well as providing substantial local benefits.

I.B.i National Significance

Major highway corridors are defined as those that carry at least 8,500 trucks per day or more than 50 million tons per year.¹ The Maryland I-81 corridor carries an average of 19,400 trucks per day, and I-70 in the Project area carries 11,100 trucks per day.

I-81 – also known as it passes through the State as the *Maryland Veterans Memorial Highway* – is a continuous north-south highway extending from Canada to Tennessee designated as a major freight corridor on the National Highway Freight Network. I-81 is a major connector linking Virginia, West Virginia, Maryland, and Pennsylvania, and is heavily utilized as a long-distance truck bypass around the congestion of I-95 and other coastal routes, delivering freight throughout the region.

I-81 is vital for the distribution of raw materials and finished goods between Appalachia and some of the largest consumer markets in the Northeast. Products like gravel, sand, wood products, non-metal mineral products, plastics, animal feed, foodstuffs, pharmaceuticals, machinery, motorized vehicles, and furniture are moved along I-81, comprising an estimated **10 percent of the nation's gross domestic product with a gross value of more than \$1.85 trillion.**

Several major North American distribution facilities are located near the I-81 corridor, beginning with the Nova Bus Manufacturing and Headquarters and Prevost Manufacturing and Headquarters in Quebec, Canada, to the Volvo Group Powertrain Manufacturing and Technology facility in Hagerstown, Maryland, to the Mack Trucks World Headquarters in Greensboro, North Carolina. More specifically, within the Project area are Tractor Supply Company, Sealy Mattress, FedEx, Home Depot, Fives Landis, and many other companies.

I-81 is also important to intermodal freight traffic, providing access to the Virginia Inland Port, which is located approximately 60 miles south of the Project area along I-81.

The Project will benefit this multistate and international freight traffic by adding one lane in each direction to manage the growing traffic, and by increasing safety in the Project area along I-81 with a high crash rate.

Project Area as a Regional Truck Service Center

Another benefit of the Project is improved access to the many services for Interstate trucks that pass through the Project area – the crossroads of I-81 and I-70. As a logistics center that attracts and generates thousands of truck trips every weekday, the Project area has become an important service center for the tens of thousands of long-distance through-trucks as well. In addition to a Pilot Travel Center with a new secure truck parking and rest area under construction, there are several truck repair facilities, convenience stores, and other truck-oriented businesses on Halfway Boulevard. There is also a Pilot Travel Center on MD 63 near the I-70 exit with parking for 84 trucks, and an average daily use of 76 trucks per day.

The location and availability of rest breaks has become critical to truck driver productivity. Truck drivers spend almost an hour a day looking for truck parking to comply with Federal Hours of Service (HOS) regulations, adding up to an estimated \$5,000 per year in losses for drivers.



One of the Nation's Freight Backbones:

I-81 is essential to moving freight in America: thousands of regional jobs are dependent on I-81 moving freight through Western Maryland.

¹ *Freight Management and Operations: Major Freight Corridors.* USDOT Federal Highway Administration.

“Interstate 81 improvements are crucial to support safe and efficient travel, and promote economic development in Washington County.”

Jeff Cline

Washington County Commissioner President



In a recent Trucker Path survey, 85 percent of drivers cited parking as the number one cause of stress at work. 70 percent of truckers have had to violate Hours of Service (HOS) regulations to find parking and 96 percent have admitted to parking in areas not designated for trucks.

In addition, 48 percent of drivers spend an hour or more a day finding safe truck parking, reducing productivity and costing truck drivers nearly \$5,000 a year in lost wages.

Source: [Truck Parking Report](#). Trucker Path, July 2018.

Having safe, reservable parking spaces at this busy freight location is important, and this Project will provide easier access to the new rest facility, including faster trip times on I-81, a shorter trip to/from I-70 west, as well as more reliable trip times should there be a lane-blocking event on either Interstate. More information on the new truck parking facility is provided in *V.C.i*.

I.B.ii Regional and Local Significance

As noted above, I-81 is a major thoroughfare through the Appalachian region, and a key link for this largely rural, low-income area to get products to market. It is also critical to the economy of the multistate region, which includes Washington County, West Virginia's Eastern Panhandle area, and part of Pennsylvania. The regional and local benefits of the I-81 improvement are discussed below, followed by the benefits of the Halfway Boulevard Extension component.

I.B.ii.a I-81 Widening and Safety Improvements

I-81 is the most heavily trafficked freight route in Maryland's State highway system, with weekday vehicle miles traveled by trucks expected to grow by 56 percent by 2040. Improvements to I-81 will provide numerous benefits in the larger Hagerstown/Eastern Panhandle region, and will become increasingly needed as traffic grows. I-81 is a critical commuter corridor connecting employees from rural areas to employment centers in Hagerstown, Martinsburg, WV, and other cities, and it is subject to daily congestion, as well as frequent backlog congestion from the high number of crashes.

The proposed widening and interchange upgrades realized through the INFRA investment will substantially increase freight volume capacity, lessen delay, and are expected to reduce the number of crashes in the I-81 corridor by at least 40 percent. These improvements complement the existing efforts to improve I-81 in the region, including the recently-completed expansion of I-81 in West Virginia, and the ongoing \$93 million project by the MDOT SHA to widen 1.3 miles of I-81 south of the current Project. Although not yet funded, MDOT SHA plans to complete the final 7.3 miles of I-81 corridor widening and improvement in two future phases, from Halfway Boulevard north to the Pennsylvania State line (see Figure 3).

The **I-81/Halfway Boulevard Freight Connection Project** has strong constituent and business advocacy at the local and regional levels. The I-81 Corridor Coalition is a consortium of stakeholders dedicated to improving the safety, continuity, and efficiency of commercial and personal travel along the I-81 corridor. This regional partnership is comprised of state departments of transportation, metropolitan and regional planning organizations, non-governmental organizations, and private entities located across six states. The widening of I-81 throughout the corridor enjoys support from key stakeholders because of its impact on economic growth in the region. Grassroots efforts from local officials and the public have led the MDOT SHA and the Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) to reprioritize funding in the HEPMPO long-range transportation plan to advance this Project. Widening I-81 has been identified as the top priority for the MPO region for nearly twenty years, and is the number one transportation priority for Washington County.

Further, I-81 is a recognized catalyst for economic development in the County. Improvements to safety and travel time on I-81 will directly impact the competitiveness of existing businesses, and the attractiveness of the region to businesses looking to locate or expand their facilities.

Halfway Boulevard

The Halfway Boulevard Extension will benefit existing and future businesses in the immediate Project area by reducing travel distance to I-70 west by one to three miles, saving up to four minutes. As I-70-bound traffic diverts to MD 63, the Project may also reduce the delays currently experienced by trucks entering I-81 at Halfway Boulevard.

The Project will also open 180 acres for development. The private developer, Bowman Development Corporation, which is donating right-of-way and contributing to the construction of the Halfway Boulevard Extension, plans to build a 450,000-square foot facility on the site surrounding the Halfway Boulevard Extension. The facility will be a combination of warehouse and manufacturing that will capitalize on the existing truck traffic feeding from the linkage between I-81 and I-70. The total value of the expected development is \$48 million, including the warehouse/manufacturing building, a retail/convenience store, and new roads and other site work.

The County has identified the Extension of Halfway Boulevard to MD 63 as an essential link for economic development. It will assist with traffic flow and reduce travel time, two factors important to business retention, and to continued business development along the Halfway Boulevard corridor. Most businesses in the Project area are related to long-distance freight transportation, and depend on access to I-70 and I-81. These include over five million square feet of warehouse and distribution centers, three gas stations/travel centers, Freightliner Repair, Rice Tire, and other businesses.

I.C PROJECT BENEFICIARIES

Washington County residents and businesses are among the primary end users for the Project. The County's 2016 population of 150,292 is concentrated around Hagerstown and along I-81, as well as smaller pockets living in the areas of Smithsburg and Boonsboro. From 2006 to 2016, the region's overall population increased by approximately ten percent, with an increase of 4.2 percent for Washington County. The City of Hagerstown has grown by an additional ten percent since the turn of the century and is now Maryland's sixth largest city, supporting economic growth in Western Maryland and adjacent states.

I-81 and I-70 are used for commuter traffic as well as long-distance truck travel. Of the more than 66,000 jobs in Washington County, 13,000 workers drive in from Pennsylvania and West Virginia, most along the I-81 corridor. I-81 is also used for outbound commuters, with 10,000 workers commuting to neighboring states.

The Project will benefit residents, commuters, and businesses by:

- ***Travel time savings on I-81*** – amounting to 4.45 million person-hours in the first 30 years after construction.
- ***Reducing crashes on I-81*** – an estimated 1,241 avoided crashes over analysis period valued at \$66.8 million.
- ***Reducing crash-related delay*** by an estimated 277,000 hours over the 30-year analysis period.
- ***Encouraging competitiveness of existing businesses by reducing trip length and travel time*** for all vehicles traveling between Halfway Boulevard and I-70 west of MD 63.
- ***Making the area attractive to future businesses*** (see safety, reliability, and travel time savings above).
- ***Increasing employment opportunities*** – the Project is expected to support an estimated 394 permanent jobs in the Halfway Boulevard area alone.

In addition to the everyday peak hour congestion on these roads, regional commuters must also deal with lengthy backups caused by crashes on I-81 or I-70 in the Project area (as discussed in *V.A.i.c.*). With the Project, the number of crashes on I-81 is expected to decrease dramatically, and the Halfway Boulevard Extension will provide a needed detour around lane-blocking crashes should they occur on I-81 or I-70 in the Project area.

I.C.i National Benefits to Long Distance and Through Travelers

During peak hours, all through travelers on I-81 will benefit from the reduction in crashes, the increased travel speeds, and the reduction of crash-related delay brought by the construction of an additional lane in each direction. Businesses that move freight and manage logistics along the East Coast, Appalachia, and the Midwest are therefore also primary end users for the Project.

Local freight companies and truckers will further benefit from the connectivity provided by the Halfway Boulevard Extension, with long distance truck trips originating on or destined to Halfway Boulevard having shorter trips to/from I-70 west of MD 63. Some of these same benefits will also accrue to some of the long-distance through traffic that may exit the Interstate and stop at the Pilot or Exxon travel centers to buy fuel, food, or to take a required rest break.

I.D TRANSPORTATION CHALLENGES TO BE ADDRESSED

Phase 2 will address four primary transportation challenges that inhibit freight movement and safe travel along the corridor in Maryland. These challenges include:

Safety

Crash rates have risen at an alarming rate on Maryland's 12-mile segment of I-81 due to overall congestion, high truck traffic, and substandard design. Between 2011 and 2017, the number of crashes increased 85 percent along the corridor. Within the Project limits (I-81 Phase 2), total crashes increased 37 percent and truck crashes rose by 34 percent between 2015 and 2017. The truck crash rate for I-81 in Maryland (at 12.1 crashes per 100 million miles traveled in 2012-2015) is more than twice as high as that of similar roadways in Maryland, which average 5.0 crashes per 100 million miles traveled.

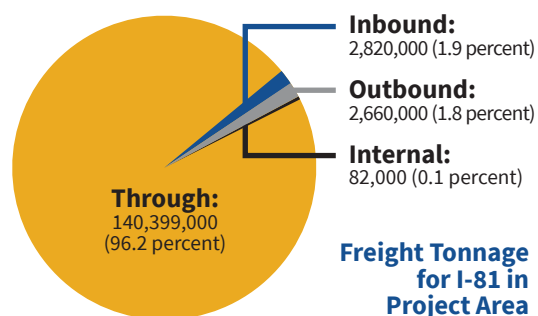
Growing Freight Demand and Inadequate Capacity

The existing number of lanes cannot accommodate current traffic volume and projected growth through 2045. Currently, the Maryland I-81 corridor is a four-lane facility and carries an average of 19,400 trucks per day, more than one-quarter – 27 percent – of all vehicles. In a 2015 study, the MDOT SHA found that I-81 is the most heavily traversed corridor by trucks in the entire State, and will see a 56 percent increase in truck VMT by 2045. Freight moved in tons is expected to increase by roughly 70 percent over the next 25 years, with forecasts indicating approximately 30,000 trucks per day by 2045.

With traffic on I-70 projected to grow as well, the benefit of having an emergency detour route along MD 63 and Halfway Boulevard will increase over time.

On Halfway Boulevard, the presence of I-81, I-70, and CSX is driving continued growth in traffic from existing distribution facilities, and creating demand for new ones, with one warehouse along New Gate Boulevard set to complete its Phase 3 expansion in March 2019.² As traffic from these developments grows, it brings new trucking services development as well, including truck servicing, fueling stations, and overnight parking, ensuring that this area will continue to be an important node in the regional and

FIGURE 2 (BELOW):
Freight tonnage for the section of I-81 within the Project area.



² *Hagerstown, MD New Warehouse Flyer.* Bowman Development Corporation.

national truck freight network. While much of Halfway Boulevard is uncongested, congestion occurs at the I-81 interchange as trucks attempt to get on the Interstate network.

The Project reduces this problem in two ways: first by increasing capacity on I-81 and improving the Halfway Boulevard interchange, and second by extending Halfway Boulevard west to MD 63 to provide easy access I-70, reducing the demand on the I-81 interchange. These improvements are needed to maintain Halfway Boulevard as an attractive location for new development and an efficient location for existing warehouse and distribution centers.

Traffic Operations

Increasing truck and overall traffic volume has accelerated the problems resulting from existing roadway deficiencies. These deficiencies include substandard interchange ramp configurations and insufficient lengths of merge lanes. Maryland is recognized as having the most dangerous stretch of I-81 in the nation, where there is a concentration of ten interchanges within just 12.1 miles. The 3.5-mile I-81 component of this Project contains three interchanges, including the I-70/I-81 four-leaf clover interchange.

Traffic volumes along I-81 south of I-70 are anticipated to grow by over 35 percent between now and 2045. These volumes are expected to result in several failing merge, diverge, and weaving operations at the US 11 and I-70 interchanges in the absence of any improvements in the corridor. Further, future travel speeds along both northbound and southbound I-81 are expected to decrease significantly between the US 11 and I-70 interchanges. The level-of-service (LOS) along I-81 has already deteriorated with the rise in traffic volume, and the expected LOS for the three interchanges in Phase 2 are D, E, and F by 2040 if no improvements are made.

Operations are also affected by capacity constraints caused by the four-lane configuration. In addition to contributing to regular peak hour congestion, a crash or construction work that blocks a lane of traffic can cause substantial delays. With three lanes in each direction, a single blocked lane of traffic will have a much lower impact on traffic delay.

Connectivity

Halfway Boulevard currently ends just a half-mile from MD 63, which has a direct interchange with I-70 less than one mile to the south. Construction of this new link will eliminate the need for vehicles on Halfway Boulevard – a major truck traffic generator – to travel east to reach I-70 west. It also provides a detour if a serious incident requires lane closures on the segment of I-70 between the I-81 and MD 63 interchanges, or on I-81 between Halfway Boulevard and I-70. Currently traffic seeking a detour brings truck and other traffic to residential and commercial areas, such as the nearby Valley Mall area, which has experienced significant drops in sales when I-81 is backed up.

TABLE 1 (BELOW): Freight tonnage statistics for the section of I-81 within the Project area.

Freight	Weight (tons)	Weight (Pct.)	Value (\$000,000)	Value (Pct.)
Inbound	2,820,000	1.9	\$2,820	1.0
Outbound	2,660,000	1.8	\$2,245	0.8
Internal	82,000	0.1	\$95	0.0
Through	140,399,000	96.2	\$280,607	98.2
TOTAL	145,962,000	100.0	\$285,767	100.0



“Improvements to I-81 will have a positive impact on nearly all of Volvo Group’s facilities in the United States.”

Pierre Jenny
VP Operations, Powertrain Production,
Volvo North America

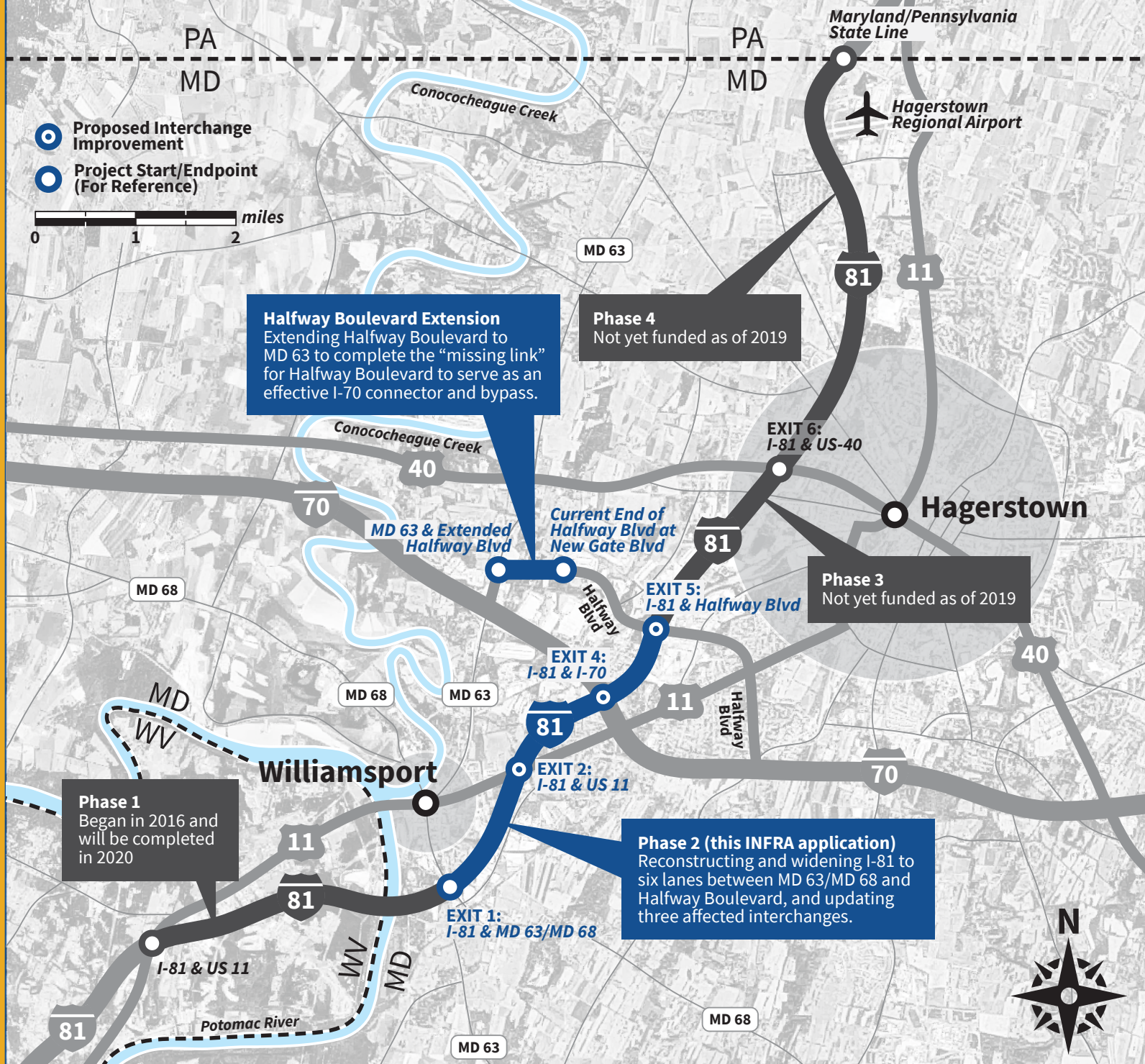


FIGURE 3 (ABOVE):
A map of the Project area showing the full extents of all four phases of I-81 widening in dark gray. Phase 2 (this INFRA application) is shown in blue, as is the Halfway Boulevard Extension.

I.E PROJECT BACKGROUND

I.E.i History of I-81 Improvements

I-81 in Maryland

I-81 Phase 2 is a critical component of a four-phase, 12.1-mile, multi-year Project with an estimated total cost of \$386.7 million. The four-phase I-81 corridor expansion Project, shown in Figure 3, is in Washington County, Maryland, stretching from Berkeley County, West Virginia, to the border with Franklin County, Pennsylvania.

The I-81 four-phase corridor expansion Project has been a longstanding priority for the State and represents one of the MDOT SHA's largest investments in Western Maryland. Planning activities began in 2001, with the completion of a Purpose and Need Statement and preliminary engineering. More than fifteen years later, MDOT broke ground in October 2016 on Phase 1, which is fully funded through a combination of State and Federal formula funds. The MDOT SHA is now aggressively setting the stage to advance Phase 2 through final design to begin construction in 2021. The INFRA grant request for Phase 2 (\$55 million) is 52 percent of the total cost of this Project, but \$55 million would make up less than fifteen percent of the overall four-phase Project cost.

Over four phases, the Maryland segment of I-81 will be widened from the existing four lanes to six 12-foot lanes. Widening will be to the inside of the roadway (in the median) for the entire 12.1-mile segment. All travel lanes will be resurfaced, and improvements will be made where necessary to ten interchanges and 14 mainline bridges. The MDOT SHA commenced construction on Phase 1 in 2016, and design activities for Phase 2 began in June 2017. The Project is requesting funding for further engineering and construction of I-81 Phase 2, along with the associated design, engineering, and construction of the Halfway Boulevard Extension.

I-81 in Neighboring States

Widening and modernization of I-81 is a priority throughout the MPO region and in neighboring states, as it is critical for economic development. West Virginia DOT widened their segment of I-81 recently and Virginia has state legislation in place to find means to fund their 200+ miles of I-81. Pennsylvania is also interested in widening I-81, but given the difficulty in finding funding, it will likely wait until Maryland's section is completed before continuing the widening north of Maryland.³

Halfway Boulevard

Washington County built Halfway Boulevard west from I-81 fifteen years ago. Given limited funding, Washington County could not afford the additional cost to bring the road further west. As described in *V.C.ii*, connecting this road to MD 63 has been a priority of the County for nearly two decades.

Since the existing Halfway Boulevard was constructed, the area west of I-81 has seen numerous successful developments, including FedEx, Staples, Tractor Supply, and many other distribution facilities and truck service businesses (see Figure 1). Further development is likely, given the area's proximity to a Class I freight railroad and to two major Interstates.



PROJECT LOCATION

II.A PROJECT LIMITS

Both Project components are in Washington County, Maryland, part of the State's 6th Congressional District. The I-81 Phase 2 Corridor Expansion begins on I-81 from 2,000 feet north of MD 63/MD 68 to 1,000 feet north of Halfway Boulevard, a distance of 3.5 miles. The Halfway Boulevard Extension extends from New Gate Boulevard (the current northwestern terminus of Halfway Boulevard) 0.55 miles west to MD 63, approximately 0.4 miles north of the MD 63 interchange with I-70.

The entire Project is located within the Hagerstown, MD-WV-PA Urbanized Area (UZA), which is considered rural for the purposes of the INFRA grant. The Hagerstown UZA had a 2010 Decennial Census population of 182,696.

Geospatial coordinates are 39.63 latitude, -77.79 longitude.

As shown in Figure 3, the Project will improve the following I-81 interchanges:

- **Exit 2:** US 11
- **Exit 4:** I-70
- **Exit 5:** Halfway Boulevard

Halfway Boulevard will be extended from its current terminus at New Gate Boulevard to meet MD 63 (also known as Greencastle Pike). It will be built as a four-lane divided road, and will head southwest to meet Business Parkway on the west side of MD 63.

II.B LOCATION

Hagerstown, MD is the largest city in the HEPMPPO area. The center of the region, Hagerstown is nicknamed “Hub City” for its position at the crossroads of I-81 and I-70, and the CSX, Norfolk Southern, and Winchester & Western Railroads. Hagerstown is also the commercial and industrial hub for a tristate area that includes Western Maryland, South Central Pennsylvania, and the Eastern Panhandle of West Virginia.

Washington County is on the eastern panhandle of Maryland, and borders Pennsylvania, West Virginia and Virginia. The County benefits from its convenient location in the heart of the Appalachian region, where excellent rail service and the national highway network provide access to 50 percent of the nation’s population overnight. Approximately twenty business and industrial parks, including two technology parks, are concentrated in the Hagerstown and Williamsport areas with easy access to I-81 and I-70, as shown in Figure 1. Nearly 2,180 acres are ready for commercial and industrial development, and approximately six million square feet of office, commercial, warehouse, and manufacturing space are in use or available for sale or lease along Halfway Boulevard alone.

The availability of industrial and office properties, combined with easy access to Maryland’s busiest freight highway, I-81, position Washington County for continued growth and development that is anticipated in the short- and long-term horizon. Currently, Washington County has more than 71,045 workers at its 3,450 companies, and is anticipating strong and stable growth with the availability of developable land along I-81. The Greater Hagerstown region is a fast-growing area, with growth of 4.9 percent between 2010 and 2016 according to the US Census. It is a major employment center for the surrounding rural region, with nearly half of all workers commuting in from neighboring states. Local businesses such as the FedEx Mid-Atlantic distribution sites and Volvo Trucks powertrain manufacturing plant depend heavily upon free-flow access to both I-81 and I-70 for efficient supply chain management.

PROJECT PARTIES

Washington County, Maryland is the applicant and proposed grant recipient. Other funding parties and supporters of the Project are discussed elsewhere in this application. The delivery and oversight of the Project components is described below.

III.A I-81 PHASE 2 COMPONENT

The construction of improvements to I-81, including interchanges, approaches, and associated work such as stormwater management facilities and noise barriers, will be carried out by the MDOT State Highway Administration (MDOT SHA). The MDOT SHA has experience with similar projects of this size and scope, and will ensure that the work is carried out in compliance with State and Federal requirements. The Project Management Plan for I-81 (including Phase 1, which is underway) is available in the appendices. Engineering design work (partially completed), and any needed acquisition of right-of-way will also be carried out by the MDOT SHA.

III.B HALFWAY BOULEVARD COMPONENT

Bowman Development Corporation currently owns the right-of-way for this component of the Project, and will donate it to the County as part of the Project. Engineering design work (partially completed) will be carried out under the oversight of Washington County.

Bowman Development Corporation, as part of its in-kind contribution, will provide site grading for the Halfway Boulevard Extension, build improvements at the new road's intersection with MD 63, and facilitate links to other roads in its new development. The remainder of the new road will be delivered by Washington County using competitively bid contracts. Washington County is fully qualified to carry out this work, having constructed similar roads, including the existing Halfway Boulevard.

IV GRANT FUNDS: SOURCES AND USES OF PROJECT FUNDS

This application requests \$55 million in INFRA grant funds for the Project with a total cost of \$105.9 million. Including non-INFRA Federal funding, this Project will be 55.5 percent Federally funded.

IV.A FUNDING SOURCES

	I-81 Improvements (\$)	Halfway Blvd Extension (\$)	Total Amount (\$)	Total Percentage (Percent)
INFRA Grant Request (Federal)	\$55.0 million	-	\$55.0 million	51.9 percent
Appalachian Regional Commission (Federal)	-	\$3.8 million	\$3.8 million	3.6 percent
MDOT (State)	\$42.6 million	-	\$42.6 million	40.2 percent
Washington County	\$1.0 million	\$2.172 million	\$3.172 million	3.0 percent
Private	-	\$1.35 million	\$1.35 million	1.3 percent
TOTAL	\$97.6 million	\$8.322 million	\$105.922 million	100.0 percent

■ TABLE 2 (ABOVE):

Sources of Project funds showing Federal, State, County, and Private contributions.

The Appalachian Regional Commission (ARC) has awarded two Local Access Road grants to Washington County for the Halfway Boulevard Extension portion of the Project, totaling \$3.8 million. These funds do not require a non-Federal match, as shown in the award notification letters in the appendices. However, the County is contributing \$3.522 million in County and Private funds for this Project component. Documentation of the commitments for these funds is available in the appendices, as are letters of support from other (non-funding) partners.

IV.B PROJECT COSTS

Uses of Funds

Spending by Project component is shown in Table 3. A detailed cost estimate for each component is available in the appendices. These cost estimates are based on Preliminary Engineering, and include reasonable contingency

factors appropriate to the scope of each component. For the I-81 component, a Financial Plan and Project Management Plan have been developed to identify and mitigate potential cost and schedule problems. The Financial Plan uses a 25 to 40 percent contingency for early engineering.

Project Activity	I-81 Phase 2 (\$)	Halfway Boulevard Extension (\$)	Project Total (\$)
Land, Rights-of-Way, Appraisals	\$1,900,000	<i>Donated</i>	\$1,900,000
Architectural, Engineering and Design	\$12,849,050	\$100,000	\$12,949,050
Project Inspection Fees	\$12,767,041	\$250,000	\$13,017,041
Construction	\$61,454,636	\$6,972,000	\$68,426,636
Subtotal	\$88,970,727	\$7,322,000	\$96,292,727
Contingencies	\$9,629,273	<i>Included in Above</i>	\$9,629,273
TOTAL	\$98,600,000	\$7,322,000	\$105,922,000

TABLE 3 (ABOVE):

Uses of Project funds as distributed between the various Project activities and components.

The appendices also include the results of a Federal Highway Administration (FHWA) Cost Estimate Review (CER) for widening all of I-81 in the State of Maryland. The CER workshop was conducted with a review team consisting of FHWA, MDOT SHA, and consultants to verify the accuracy and reasonableness of the cost estimates and schedule, and to develop a probability range for the cost estimate that represents the Projects' current stage of development. The results were used as the basis for setting the baseline total cost in the Initial Financial Plan.

Washington County and MDOT understand that cost overruns on either component of the Project will be their responsibility. Further, construction contracts typically are structured to shift the risk of cost overruns to the construction contractor.

IV.B.i Previously-Incurred Expenses

Previously-incurred expenses on I-81 Phase 1, and the \$5 million in design and environmental work for I-81 Phase 2 are not included in the \$105.9 million total Project cost. The I-81 Phase 1 cost is \$93 million, some of which was contributed by West Virginia Department of Highways to cover the expense of the bridge over the Potomac River separating the two states. The value of the right-of-way cost of the Halfway Boulevard Extension is also not included in the \$105.9 million Project cost.

IV.B.ii Financial Need

While widening I-81 has been a top priority for twenty years now, the barrier to getting this Project built is funding, given that County and State resources are limited. MDOT covered the cost of Phase 1 with some assistance from West Virginia. After many years, Phase 1 is currently under construction. Without this grant, it is not known how many years it will take for MDOT to find funding for the remaining cost of Phases 2 through 4, which total nearly \$300 million. During this time, growing traffic will only worsen the safety and congestion problems on I-81.

The County is seeking INFRA funding because of the high burden of the cost of widening I-81 on the County and the State, particularly given that over 90 percent of the freight traffic in the County is through-traffic, neither originating in nor destined to Washington County. The County's efforts to fund local connectivity needs, such as extending Halfway Boulevard to meet MD 63, are described in *V.C.ii*. Washington County officials and business groups have put in great effort over the years to commit local funding, secure the ARC grant, and include Private contributions as part of the funding package.

V

MERIT CRITERIA

V.A SUPPORT FOR NATIONAL OR REGIONAL ECONOMIC VITALITY

This Project will contribute to economic vitality by providing national, regional, and local benefits for the movement of freight and people, described in the subsections below:

- Improved Safety on I-81
- Crash-Related Travel Delay Reduction
- Traffic Operation Benefits from I-81 Improvements
- Improved Access to/from I-70 via Halfway Boulevard
- Economic Development

V.A.i Improved Safety on I-81

Crashes cause an undue burden on all road users. In addition to fatalities, injuries, and property damage, highway crashes also create traffic delay, and increase the cost of insurance for the movement of people and goods. Safety benefits resulting from improvements to I-81 are expected to be substantial, as discussed in detail below.

At 15 percent, crashes that occur on Maryland's stretch of I-81 represent a disproportionate number of crashes in Washington County. The unacceptable level of crashes is partially due to a concentration of ten interchanges in a 12.1-mile span within Maryland, including three interchanges in the 3.5-mile segment part of this Project. Current design standards recommend at least two miles between interchanges. Further, the roadway does not meet modern design standards for limited access highways.

An additional safety concern is the high overall traffic volumes, and particularly the high truck volumes. The four-lane I-81 was originally designed to handle 15 percent truck traffic, and current truck volumes are approaching twice that number. I-81 in Maryland averages about 71,300 annual average daily traffic (AADT) with truck volumes accounting for 27 percent of all traffic. Portions of I-81 near Halfway Boulevard have even higher truck percentages. This high volume of truck traffic exacerbates the weaving, merge, and diverge problems associated with the closely-spaced interchanges. The MDOT SHA has specifically found that weave problems exist at the I-70 and Halfway Boulevard interchanges, resulting in a high number of rear-end truck crashes and sideswipe crashes.

High truck volumes lead to greater risk for serious crashes that can cause fatalities and injuries, as well as resulting in hours of backlog congestion. On I-81, almost 20 percent of all crashes are related to trucks. I-81's 2013-2015 truck-related crash rate of 13 crashes per 100 million vehicle-miles is substantially higher than the 2012 statewide average rate for similar roadways (5 crashes per 100 million vehicle-miles).

This rate has been increasing in recent years, as shown in Table 4. The fatal crash rate on I-81 has, on average, been substantially higher than the 2012 statewide average of 0.3 fatal crashes per 100 million vehicle-miles. Alcohol and surface conditions were not considered factors in any of these crashes.



About the Crash Shown Above:

On February 27, 2019, as Washington County was preparing this grant application, there was another serious truck crash in the Project area on I-81 southbound between Halfway Boulevard and I-70. The crash between two tractor trailers closed both lanes of I-81 southbound for two hours.

Year	Crash Rate (Crashes per 100 million VMT)	Truck Crash Rate (Crashes per 100 million VMT)	Fatal Crash Rate (Crashes per 100 million VMT)
2010	24.8	6.8	0.8
2011	27.4	4.6	0.4
2012	35.0	9.3	0.8
2013	34.0	9.7	0.8
2014	43.7	17.8	0.8
2015	40.8	11.7	0.0
2012 STATEWIDE RATE	44.3	5.0	0.3

TABLE 4 (ABOVE):

Crash rates on Maryland's section of I-81 compared to statewide crash rates at the bottom.

Based on crash data between 2012 and 2017, there were 371 reported crashes that occurred on I-81 within the Project area, including two fatal crashes and 108 injury crashes resulting in 141 injured persons. The number of crashes averages 62 per year.

V.A.i.a Project Safety Improvements

The Project will improve safety on I-81 by widening and modernizing I-81 and the three interchanges in the Project area. The expected reduction in crashes is anticipated to align closely with the recently realized reduction of crashes along I-81 in West Virginia. In 2011, West Virginia completed widening I-81 from four lanes to six lanes. The project resulted in an 80 percent reduction of crashes along the corridor over a four-year period when compared to the previous four years.

The realized safety benefits in West Virginia are a strong indicator that Maryland will experience a similar crash reduction. However, to be conservative, the Benefit-Cost Analysis (BCA) only assumes half of that benefit, i.e., a 40 percent drop in crashes, to account for the fact that West Virginia's section of I-81 was in worse condition overall before the expansion project was undertaken.

A 40 percent reduction in crashes would lead to an estimated reduction of 1,241 crashes on I-81 in the Project area in the first 30 years after construction is complete.

V.A.ii Crash-Related Travel Delay Reduction

Crashes, in addition to causing fatalities, injuries, and property damage, also cause a great deal of travel delay on heavy-traffic roads such as I-81. When a severe crash occurs along I-81 and causes a closure of a lane or the roadway, lengthy vehicle backlogs occur and impact thousands of travelers. The existing local roadway network near the Project provides detours that are slow, lengthy, or travel through areas of Hagerstown that are not suited for large volumes of truck traffic. This includes residential areas as well as retail commercial areas.

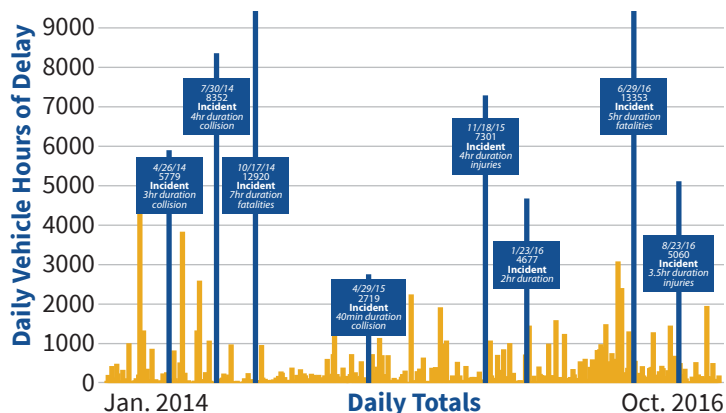
The reliability of travel times along I-81 in Maryland has become a significant problem for motorists and freight carriers. Based on available INRIX travel time data, nearly 200,000 hours of vehicle-delay occurred along this roadway corridor between January 2014 and October 2016. As illustrated in Figure 4, traffic delays fluctuate substantially, both by hour and day, making it difficult for motorists to anticipate or avoid traffic congestion. Traffic incidents have been identified as a root cause of substantial delays.

An important benefit of the Project is its ability to reduce crash-related delay. Travel time savings will result from the following Project effects:

- An expected reduction in crashes on I-81 due to widening and modernization of the roadway and interchanges.

- Adding a new lane in each direction on I-81 means that when a crash blocks one or two lanes, the remaining capacity of I-81 will be much better able to handle traffic backlog.
- The new connection provided by the Halfway Boulevard Extension will provide a safer, more direct detour for incidents that occur on segments of I-81 and I-70 between the I-70/MD 63 interchange and the I-81/Halfway Boulevard interchange.

As assessed in the BCA, the annual benefit of reducing crash-related delay is estimated at 176,334 hours over the 30 year benefit analysis period.



“When an accident occurs on I-81 in Maryland, it causes retail and restaurant sales to drop from 17 to 28 percent for the day depending on the length of time the accident backlogs traffic.”

Julie Rohm
General Manager, Valley Mall

FIGURE 4 (ABOVE):
INRIX daily vehicle hours of delay and major crashes on the Maryland section of I-81.

V.A.iii Traffic Operations Benefits from I-81 Improvements

The Washington County travel demand model was used to assess improvements in travel times, speed, and LOS on I-81. Benefits of the two Project components are discussed separately due to limitations in the County traffic model.

Managing Growth in Demand on I-81

In 1989, overall volumes along the I-81 corridor ranged from approximately 30,000 to 50,000 AADT. Now, three decades later, the volume on I-81 averages 71,300 AADT. The MDOT SHA’s statewide travel demand model projects AADT to be as high as 110,000 vehicles by 2040, representing a growth of nearly 40,000 total vehicles per day. This is supported by FHWA’s Freight Analysis Framework (FAF) forecasts, which foresee truck traffic on I-81 in Maryland to increase by more than 50 percent over the next 30 years to reach nearly 30,000 trucks per day by 2045. With this expected increase in both through freight traffic and other traffic types, it is critical to increase capacity in this corridor.

Level of Service

Freight movement needs reliable traffic operations with minimal delays. Currently existing warehousing businesses along Halfway Boulevard complain that during many hours of the day, their trucks are delayed getting onto I-81 and I-70 at nearby interchanges. With 56 percent growth in traffic volumes expected by 2040, this delay will only worsen.

The Level of Service (LOS) on the **Phase 2** segment currently ranges from B to D, and is projected to deteriorate to B to F by 2040 under the No Build scenario. This decrease in service levels is due to increased volumes leading to increased truck-to-auto friction, causing degradation of the I-81 merges and diverges. Several notable, high-traffic areas are projected to operate poorly (LOS E), or to fail (LOS F), under the 2040 No Build conditions, as shown in Table 5.

Facility (Weave, Diverge, or Merge)	2016 PM Existing LOS	2040 PM No Build LOS	2040 PM Phase 2 LOS
I-81 NB Diverge to I-70	C	D	E
I-81 SB Merge from I-70	D	F	D
I-81 NB Diverge to US 11	B	D	B
I-81 NB Merge from US 11 EB	B	B	B
I-81 NB Merge from US 11 SB	B	C	C
I-81 SB Diverge to US 11	B	F	D
I-81 SB Merge from US 11	C	E	C
I-81 NB Diverge to MD 68	B	B	B
I-81 NB Merge from MD 68	B	C	B
I-81 SB Diverge to MD 68	B	B	B
I-81 SB Merge from MD 68	B	B	A

TABLE 5 (ABOVE):

Projected Levels of Service (LOS) for I-81 Phase 2 compared to existing and No Build scenarios.

Currently, the I-81 merge lanes from I-70 operate at a deficient LOS D during evening peak travel hours. Without the Project, these lanes will drop to LOS F; with the Project they will be at LOS D at 2040 traffic volumes. With the Project, several of the previously identified LOS degradations under 2040 No Build are mitigated to acceptable levels of service, expanding capacity for freight movement, and reducing travel times for all users.

Travel Time Savings

Not surprisingly, the Project's improvement in LOS is associated with higher travel speeds and correspondingly reduced travel times. With the completion of the I-81 Phase 2 improvements, travel speeds improve in both directions of the I-81 mainline corridor compared to the 2040 No Build conditions, as shown in Table 6.

I-81 Segment	2017 EXISTING (mph)		2040 NO BUILD (mph)		2040 PHASE 2 (mph)	
	AM	PM	AM	PM	AM	PM
I-81 NB: Between MD 68 Ramps	63	64	57	59	65	64
I-81 NB: MD 68 to US 11	61	63	52	56	64	63
I-81 NB: Between US 11 Ramps	60	62	60	58	62	61
I-81 NB: US 11 to I-70	58	63	57	53	59	58
I-81 SB: I-70 to US 11	61	52	47	63	52	63
I-81 SB: Between US 11 Ramps	64	58	57	64	64	61
I-81 SB: US 11 to MD 68	66	59	59	64	64	64
I-81 SB: Between MD 68 Ramps	66	64	64	65	65	65

TABLE 6 (ABOVE):

Projected average travel speeds for I-81 Phase 2 compared to existing and No Build scenarios.

With the completion of Phase 2, the model shows speeds nearly all return to the 2017 existing conditions through the implementation of Phases 1 and 2. Along certain segments, the new six-lane facility will increase

speed by more than ten miles per hour, expediting the movement of freight through the corridor. The MDOT SHA's modeling results address recurring delay, which includes typical daily peak period traffic congestion. Non-recurring delay, including the impacts of traffic incidents discussed above, is not considered in the modeling.

The BCA calculated a total travel time savings of 3.7 million hours during the 30-year benefit analysis period.

V.A.iv Improved Access to/from I-70 via Halfway Boulevard

To enhance economic competitiveness, it is important to have improved travel speeds and travel time reliability on major freight routes such as I-81. Improved access to the truck rest areas on Halfway Boulevard also improves truck driver productivity, as drivers can more easily estimate their arrival times.

The Project's connectivity improvement will reduce travel distance and travel time for vehicles traveling from I-70 west to destinations on Halfway Boulevard, and to nearby roads such as New Gate Boulevard and Hopewell Road. A similar benefit will occur for westbound traffic from the Project area. The mileage saved is between 0.9 miles (e.g., for businesses along Hopewell Road), and 2.6 miles (for destinations further west, such as Sealy Mattress). Reduced mileage to and from the new rest area is estimated at 1.0 miles.

Given the large number of trucks heading to and from this area from I-70 west of MD 63, the BCA estimates a total of 14,470 hours and 723,483 miles saved each year. The reduced miles provide benefits in terms of reduced fuel use, reduced emissions, and avoided wear and tear on vehicles and roads, making freight trips more efficient overall.

V.A.v Economic Development

The Project will directly lead to \$48 million in local economic development benefits tied to the planned Bowman Development Corporation development immediately adjacent to the proposed Halfway Boulevard Extension. Economic development benefits will also accrue to businesses located in the immediate Project area, and all along the I-81 corridor, with improved transportation efficiencies from travel time savings and VMT reduction.

For the MPO region, improving mobility along the I-81 corridor and enhancing the connectivity of the County and local road network are top priorities. Improving traffic operations in the I-81 corridor will make commuting easier, and expedite other business and non-business travel. A transportation system that operates well is more attractive for new businesses to locate, and increases the likelihood that existing businesses will expand.

The connectivity benefits of the Halfway Boulevard Extension make trips shorter and travel times shorter and more reliable, and provide resiliency for situations where I-70, I-81, or other roads are backed up due to construction needs or crash management. Put together, the two components of this Project provide important transportation efficiency benefits for the Project area, including 21.7 million fewer vehicle miles traveled, and 4.4 million hours of travel time saved during the BCA's 2024-2053 analysis period.

The number of recent, under construction, and planned warehouse and distribution facilities around the Project area amply demonstrate its economic vitality and potential for growth (see Figure 1). With the completion of the Project's I-81/Halfway Boulevard/I-70 loop, existing and future development in this area will be able to provide more competitive freight services, lowering the costs for delivering goods all along the I-70 and I-81 corridors. This will ensure a more stable and growing employment base in this rural area. However, without the Project, the utility of this area will decrease, as the growing number of trucks spend more time in delayed conditions waiting to enter I-81.

V.B LEVERAGING OF FEDERAL FUNDING

V.B.i Efforts to Leverage Federal Funding

MDOT and Washington County have worked for nearly two decades to pull together the funding for the I-81 Corridor and for the Halfway Boulevard Extension, and these efforts are described separately below. The non-Federal match for the INFRA grant is \$47.12 million, or 44.5 percent.



“As the largest real estate developer in Washington County, Bowman Development is greatly affected by the I-81 widening Project. The success of our development will depend on the continued efficient and safe traffic flow on I-81.”

Donald Bowman

Owner and Chairman of the Board,
Bowman Development Corporation

V.B.i.a I-81 and State Funding

Widening I-81 in Maryland was identified as a priority for the multistate region twenty years ago. Three years ago MDOT developed a Finance Plan and a Project Management Plan to ensure that the 12-mile, \$386.7 million Project could be completed.

As of 2019, Phase 1 is under construction, with \$93 million committed to date. For Phase 2, MDOT has spent \$5 million for Project design costs, and worked with Washington County to secure additional funds to support construction. The State also participates as part of the multistate I-81 Corridor Coalition, which seeks to coordinate efforts along the corridor. I-81 Phase 2 continues to have significant support, as evidenced by the MDOT SHA's \$42.6 million commitment of State funding; see MDOT's Funding Commitment Letter in the appendices.

Maryland was one of the first in the nation to create a Transportation Trust Fund, an integrated account dedicated to funding the State's transportation needs. The Maryland Transportation Trust Fund is indexed to the Consumer Price Index and a sales and use tax equivalent rate that is annually adjusted as a percentage of retail price.⁴ Indexing the Fund to inflation provides a more stable non-Federal revenue stream.

Despite this ongoing investment, Maryland's transportation needs continue to outpace available funding. As a result, the MDOT SHA has considered other alternatives for funding its transportation needs, including use of a public-private partnership (P3) delivery model for I-81. The MDOT SHA determined that Phase 2 (as well as the entire, four-phase Project) is not an ideal candidate for P3 because there is not sufficient private sector market appetite. The limited number of lane miles constrain the Project's financial feasibility and the rate of return that would be acceptable to potential concessionaires. The MDOT SHA found that projects with greater than 30 lane miles are more suitable to P3.

Instead, the MDOT SHA chose the Design-Build delivery method to maximize its scarce dollars. Design-Build decreases the schedule for delivery since design/engineering and construction are managed under one procurement. The MDOT SHA estimated that the procurement time-savings will accelerate the Project

by 12 to 18 months. Design-Build also provides opportunities for innovation to address congestion and constructibility concerns along mainline I-81 and at the interchange ramps.

V.B.i.b ARC Funding

MDOT has also supported Washington County in securing funding from the Appalachian Regional Commission (ARC). The ARC grant program is designed to further economic progress in distressed Appalachian counties throughout thirteen states. The grants are used to support business development and entrepreneurship, education and training, healthcare, and physical infrastructure.

4

See Md. Tax-General Code Ann. §9-305, §9-306, §2-1103; 2013 Md. Laws, Chap. 429.

ARC understands the importance of this critical freight corridor through Appalachia, and has awarded two Local Access Road grants to Washington County for the Halfway Boulevard Extension portion of the Project, totaling \$3.8 million. These funds do not require a non-Federal match, as shown in the award notification letters in the appendices. However, the County is contributing \$3.522 million in County and Private funds for this Project component.

V.B.i.c County and Private Funding

For the Halfway Boulevard Extension, Washington County has been working since at least 2000 to find funding to strengthen and better connect its roadway network despite limited funding availability. As described in *V.C.ii*, Washington County developed a program, *Making Connections* to leverage development interests in the creation of needed transportation infrastructure.

The program was successful in securing \$1.35 million from the private company Bowman Development Corporation, which is contributing to the construction of the Halfway Boulevard Extension, as well as donating right-of-way valued at \$0.5 million. The County is also contributing \$1 million to assist with the non-Federal match for widening I-81.

V.C POTENTIAL FOR INNOVATION

V.C.i Technical Innovation

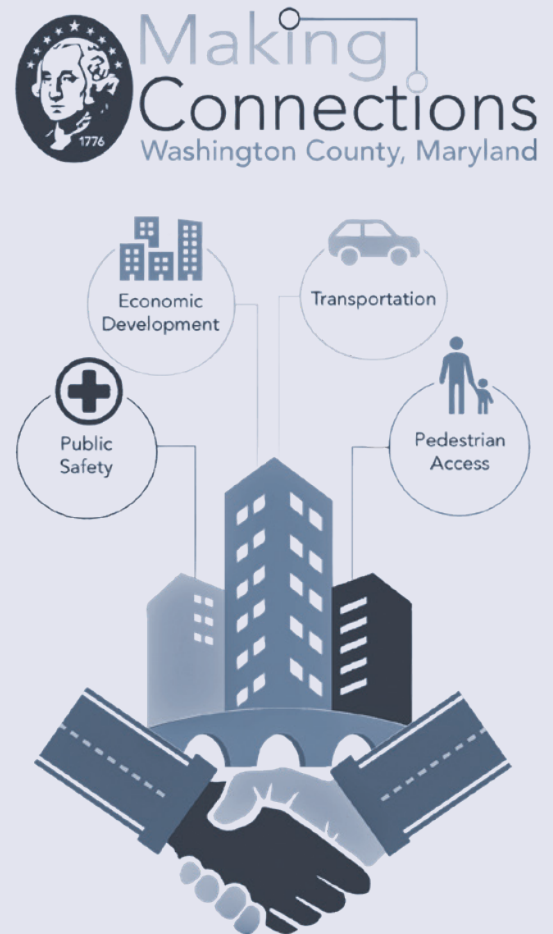
This Project will improve access to a new, secure, 24-hour truck parking facility under construction on Halfway Boulevard. For a small fee, drivers can reserve a spot in this 170-space lot, using their smart phones to gain entry to the facility. With shorter, more reliable travel times to this facility, long-distance truck drivers will be able to increase their productivity while staying within their FMCSA hours of service limitations.

V.C.ii Innovation in Finance

Washington County has limited funding to construct new roads, but identified a number of road connections that were needed to enhance connectivity in areas outside of Hagerstown. It recently identified four projects where public-private partnerships could be utilized to share the costs of construction. Halfway Boulevard was one of these projects.

Washington County built Halfway Boulevard approximately fifteen years ago, knowing that it did not have the funds to build it far west enough to connect to MD 63. The County hoped that the Extension could be built in the future, as development along the new road grew. This assumption proved to be correct, with the Bowman Development Corporation understanding that a new road would open a large area for development, as well as providing an important link in the County road network.

Bowman has agreed to donate the right-of-way for the road Extension to the County so that they can continue to operate and maintain the road. Bowman also contributed \$1,350,000 towards the construction of the road (\$750,000 as cash, and the rest as in-kind site clearance and other construction work).



“Connecting Washington County by creating partnerships and improving economic development, transportation, public safety, and pedestrian access.”

Making Connections Program
Washington County, Maryland

V.C.iii Innovation in Project Delivery

The I-81 component of the Project will showcase innovations in environmental review and permitting and experimental project delivery. The Project planning phase concluded with a FONSI document approved by FHWA and concurrence from the environmental review/permit agencies. However, the MDOT SHA is interested in participating in USDOT's new environmental and permitting approach. The MDOT SHA is still evaluating the project delivery method it will use for Phase 2 of the I-81 corridor widening Project. Whether it selects Design-Build or Design-Bid-Build, the MDOT SHA will use Special Experimental Projects Number 14 (SEP-14) tools to speed the pace of Project construction.

Washington County will bid out most of the construction of the Halfway Boulevard Extension. The resulting contract will utilize schedule bonuses to ensure that the Project is delivered when expected.

V.D PERFORMANCE AND ACCOUNTABILITY

V.D.i Performance

All operations and maintenance on Maryland's State highways are performed by the MDOT SHA, including long-term rehabilitation type work. With over 17,000 lane-miles to operate, the MDOT SHA is keenly aware of the critical need to maintain its system to safely and effectively move people and freight.

The Halfway Boulevard Extension will be operated and maintained by Washington County, which is responsible for the existing segments of Halfway Boulevard. Estimated operating and maintenance costs for the Project are detailed in the BCA Report in the appendices.

V.D.ii Accountability

The MDOT SHA is confident in its ability to deliver Phase 2 of the I-81 corridor widening on-time and on-budget. It is willing to condition construction funding upon meeting specific planning, engineering, and procurement deadlines. Table 7 shows how the MDOT SHA will structure conditions on the funding.

Activity	Date	Percent Award Forfeited
Notice to Proceed	April 30, 2021	5 percent (\$2.75 million)
Substantial Completion	October 31, 2023	5 percent (\$2.75 million)
TOTAL AWARD SUBJECT TO ACCOUNTABILITY GOALS		10 percent (\$5.5 million)

■ **TABLE 7 (ABOVE):**

Funding timeline and conditions for the Project.

VI PROJECT READINESS

VI.A TECHNICAL FEASIBILITY

In June 2016, the MDOT SHA issued a Project Management Plan (PMP) for the entire four-phase I-81 Project. The PMP provides a detailed description of the management systems and processes that will guide the full range of Project activities to ensure Project completion, as well as organizational roles and responsibilities and key staff. A copy of the Project Management Plan is included in the appendices.

Halfway Boulevard will be constructed using standard designs and materials. The right-of-way is privately held, and the owner, Bowman Development Corporation, has agreed to donate it. There are no steep grades or any

engineering difficulties expected with this 2,800-foot Extension. Washington County has experience with projects of a similar scope and size.

VI.B PROJECT SCHEDULE

The MDOT SHA will have all necessary pre-construction activities completed by June 30, 2020 and intends to obligate an INFRA investment for the construction of I-81 Phase 2 by September 30, 2020.

The MDOT SHA has demonstrated a significant capacity to deliver projects utilizing the Design-Build delivery method on over 45 projects valued at over \$900 million. Additionally, four Design-Build contracts for the InterCounty Connector Mega-project, valued at over \$1.5 billion, were delivered by the MDOT SHA.

I-81 Phase 1 design activities began in 2013, were completed in March 2016, and the MDOT SHA began construction in October 2016, with anticipated completion in Summer 2020. A statewide priority, the MDOT SHA is now actively advancing Phase 2 through the design and engineering process, and fully anticipates letting a contract on Phase 2 in April 2021.

While design officially commenced in June 2017, the completed design and construction documents for Phase 1 will provide the MDOT SHA with efficiency during Phase 2. A Project schedule for I-81 Phase 2, including an anticipated contract award timeframe, is displayed in Table 8.

Final design and the environmental and permitting process for the Halfway Boulevard Extension is expected to be completed in time to begin construction in Spring or Summer 2020. Construction should be complete no later than Fall 2021.

Project Activity	Timeline
Design-Build Advertisement (RFQ)	June 2020
Proposals Due	January 2021
Notice to Proceed	April 2021
Substantial Completion	Fall 2023

■ **TABLE 8 (ABOVE):**
Schedule for the Project's various activities.

VI.C REQUIRED APPROVALS

Planning and environmental review for the entire Maryland I-81 corridor expansion is complete; final design for Phase 2 will be initiated once notice of award is received.

VI.C.i Environmental Permits and Reviews

The MDOT SHA utilized the Streamlined Environmental/Regulatory Process for the Project planning phase of the I-81 corridor study. The Project planning phase concluded with a FONSI document approved by FHWA, concurrence from the environmental review and permitting agencies on a preferred/selected alternative, and a corridor permit for wetland/waterway impacts. Any changes during subsequent phases of the Project will likely require only a re-evaluation of the NEPA document and an update of the corridor permit.

The MDOT SHA followed the regulatory requirements of the National Environmental Protection Act (NEPA) in preparing environmental review documentation for the I-81 corridor expansion program in Maryland. Agency concurrence on the Purpose and Need was received in October 2001, and an EA was completed on September 15, 2004.

MDOT issued a FONSI/4(f) Evaluation document for the Project in February 2010. A reevaluation document was

completed for Phase 1 in 2016, which enabled Phase 1 to be advertised for construction and to begin work in October 2016. The environmental reevaluation for Phase 2 is expected to be approved by the FHWA in 2019 or 2020. Copies of the EA and FONSI are included in the appendices.

This Project presents an opportunity to mitigate existing environmental impacts from the original construction of I-81. The existing runoff on this segment of I-81 drains to median inlets and is conveyed to outfalls into roadside ditches and streams. The Project will add stormwater management facilities at the I-70 and Halfway Boulevard interchanges. In addition, median areas will be evaluated to try and maximize the impervious surface runoff treatment using grass swales and bioswales. Mitigation to wetlands and forests that are impacted by the Project is also being investigated.

Halfway Boulevard has completed coordination with the State Historical Preservation Officer and the Maryland Department of Natural Resources. Additionally, Washington County has performed a traffic noise analysis and wetlands and waterways review of the Extension project area. The alignment of the road was altered to avoid sensitive resources. Coordination letters are included in the appendices.

VI.C.ii State and Local Approvals

The MDOT SHA will complete the permit and approval process for I-81 Phase 2 by February 2020. The permits received for Phase 1, which should be similar to those required for Phase 2, include: Maryland Department of Environment (MDE) E&S Approval; MDE SWM Approval; NPDES Permit for Storm Water Associated with Construction Activity; MDE Non-Tidal Wetland Permit; MDE Water Quality Certification; US Army Corps of Engineers Permit; and the Maryland Department of Natural Resources Roadside Tree Permit. As noted above, Washington County has begun, and in some cases finished, coordination with State resource agencies regarding the Halfway Boulevard Extension.

VI.C.iii Federal Transportation Requirements Affecting State and Local Planning

As noted above, both components of this Project have long been in the transportation planning documents for the MPO and the State of Maryland. Specifically, one or both components are included in the following:

- HEPMPO Transportation Improvement Program (TIP)
- MDOT 2017 Statewide Transportation Improvement Program (STIP)
- HEPMPO 2045 Long Range Transportation Plan
- MDOT 2040 Maryland State Transportation Plan
- Maryland Strategic Goods Movement Plan

VI.D ASSESSMENT OF PROJECT RISKS AND MITIGATION STRATEGIES

Both components of this Project are extensions of previous work done by the MDOT SHA (I-81 Phase 1) and Washington County (the existing Halfway Boulevard). Both use standard designs and materials and are therefore low-risk projects.

I-81 Component

Project risks for the I-81 improvements are discussed in the Project Management Plan and the Financial Plan documents completed for I-81 Phases 1-4, which are in the appendices. In addition, risk mitigation strategies have been fully delineated in detail for Phase 1, and will serve as a foundational baseline for developing the more formal risk mitigation strategy for Phase 2. The Phase 1 risk mitigation strategy is available upon request.

Halfway Boulevard Component

Given the nature and limited scope of the Halfway Boulevard Extension, the potential for construction and environmental risks are low. One other potential risk is not receiving the funding or promised site clearance work from the private developer if, for example, there is an economic change that would make the overall development project unprofitable or difficult to finance, or in the event the developer experiences a significant change in financial situation. However, this risk is also low. Bowman Development Corporation is stable; it is one

of the largest developers in Washington County, and it is involved in numerous projects of a similar size. The interest in developing this property, from both local government and the developer, has continued for a number of years. Bowman currently owns the land, and similar adjacent land uses are thriving and expanding, so it is unlikely that the developer would not move forward with their development project if the INFRA grant is awarded, and similarly unlikely that they would fail to contribute to the Halfway Boulevard Extension, which is integral to the development project.

VII LARGE PROJECT REQUIREMENTS

The I-81/Halfway Boulevard Project supports both national and local/regional economic vitality by improving capacity, resilience, reliability, travel time savings, and connectivity on the nation's highway freight network.

I-81 is a major freight route as evidenced by the extraordinarily high truck volumes, most of which is through-travel originating from and destined to other states. Almost entirely contained within the Federally-designated Appalachian Region, I-81 is a vital route for the distribution of raw materials and finished goods between Appalachia and some of the largest consumer markets in North America. I-81 also serves as a long-distance truck bypass around major areas of urban congestion. A 2012 study published by the I-81 Corridor Coalition examined the economic significance of I-81 to the Appalachian Region, and identified I-81 as a critical asset supporting national and global commerce.

The fact that over 96 percent of the freight movements in Washington County, Maryland are through-movements (see Figure 2) also attests to the importance of this area to the national network. With a growing number of crashes, and increasing congestion – including substantial crash-related delay – it is important that capacity and other improvements be made to this segment of I-81 as soon as possible, continuing the widening work begun in West Virginia and currently underway in Maryland, just south of the of the Project area.

In addition to travel time savings and safety benefits, the Project also provides improved access for truck drivers traveling on I-81 and I-70 to reach repair services, fueling stations, and safe rest areas near Halfway Boulevard.

Locally, the Project is needed to allow the continued success of this area as a warehouse, distribution, and truck services center. Improving capacity on I-81 and upgrading interchanges will help commuter traffic and reduce the delays experienced by trucks entering I-81. Further, the new connection of Halfway Boulevard to MD 63 and I-70 will reduce travel times to and from the Project area. Given the area's access to two major Interstates, as well as to a Class I railroad, this Project will allow the area to continue to grow and succeed as a freight distribution center.

As described below, the Project has a quantified benefit-cost ratio (BCR) of 1.34, indicating that the Project's benefits clearly outweigh the costs.

VII.A BENEFIT-COST ANALYSIS

A benefit-cost analysis (BCA) was conducted, following USDOT guidance, to compare the Project's benefits to its total costs over a 35-year period. The analysis period includes five years of construction (2019-2023) and 30 years of benefits after Project completion (2024-2053). The benefits assessed are summarized in Table 9 – cars and trucks will travel 21.7 million fewer miles because of the new Halfway Boulevard Extension and save 4.45 million hours of drive time as a result of both Project components. Reducing travel time and mileage brings associated benefits, including reduced fuel usage (2.3 million fewer gallons of diesel and gasoline), and reduced emissions. The BCA also values safety benefits, which are anticipated to add up to almost 1,300 avoided accidents over 30 years.

Category	Unit	Quantity	Direction
Vehicle-Miles Traveled	VMT	22,427,974	▼
Vehicle-Hours Traveled	VHT	4,449,730	▼
Fuel Consumed	gallons	2,363,916	▼
Fatalities	number of accidents	16	▼
Injury Accidents	number of accidents	583	▼
Property Damage Only (PDO)	number of accidents	642	▼
CO ₂ Emissions	tons	49,042	▼
NO _x Emissions	tons	78.15	▼
PM ¹⁰	tons	1.56	▼
SO _x	tons	0.35	▼
VOC	tons	14.25	▼

■ **TABLE 9 (ABOVE):**

Summary of Project benefits as described in greater detail in the BCA.

Table 10 presents the valuation of these benefits in 2017 dollars, discounted at 7 percent. Costs are also shown, including the \$105.9 million in capital costs, as well as the future operating and repair costs over the analysis period. The residual value calculation estimates the value of the Project after the end of the analysis period.

Details on the assumptions and methodology used to calculate the costs and benefits are in the BCA Report, available in the appendices.

The total benefits from the Project improvements over the analysis period are calculated to be \$113.9 million in discounted 2017 dollars. The total Project costs, after discounting, are calculated to be \$84.6 million. The difference between the benefits and costs yields a net present value of \$29.2 million in 2017 dollars, resulting in a benefit-cost ratio (BCR) of 1.34.

More than half of the benefits (59 percent) are from **reduced crashes** on I-81. A further 27 percent of the benefits result from **travel time savings** from three areas: capacity improvements on I-81, shorter trip lengths to access I-70 via the Halfway Boulevard Extension, and a reduction in crash-related delay.

BCA Metric	PROJECT LIFECYCLE	
	Undiscounted (\$)	Discounted At 7 Percent (\$)
Total Benefits	\$423.9 million	\$113.9 million
Total Costs	\$102.8 million	\$84.6 million
Net Present Value (NPV)	\$321.1 million	\$29.2 million
BENEFIT COST RATIO (BCR)	4.13	1.34

■ **TABLE 10 (ABOVE):**

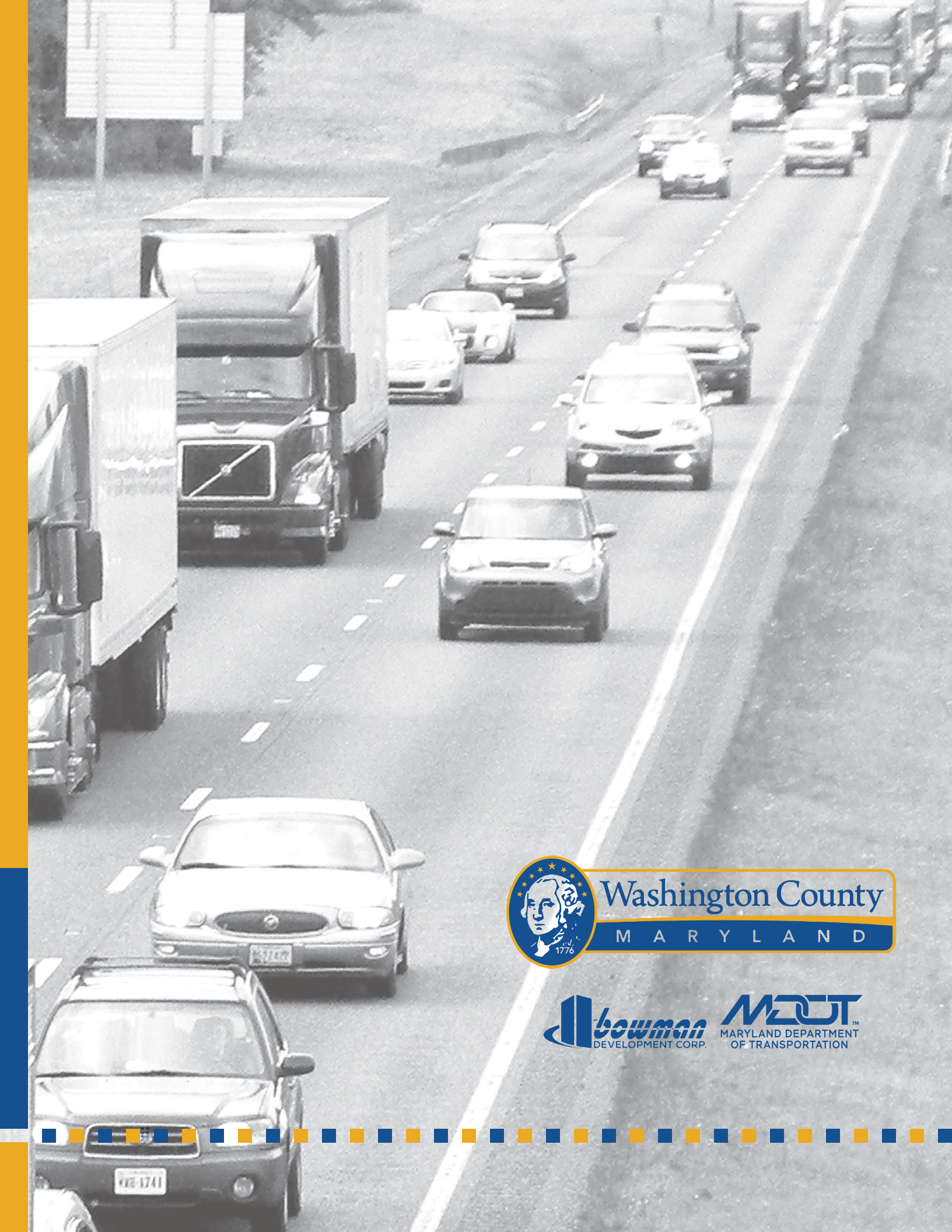
Benefit Cost Analysis Results.

LIST OF APPENDICES

All appendices are housed on the MDOT website and can be accessed at the URL below, as well as accessed individually in the hyperlinks for each appendix below:

<http://mdot.maryland.gov/INFRA>

- **Appendix 1:** Benefit-Cost Analysis Report
- **Appendix 2:** I-81 Cost Estimate
- **Appendix 3:** I-81 FHWA Cost Estimate Review Final Report
- **Appendix 4:** I-81 Financial Plan
- **Appendix 5:** CTP, TIP, and LRTP – I-81 and Halfway Boulevard
- **Appendix 6:** I-81 Phase 2 Tech Project Engineering Drawings
- **Appendix 7:** Halfway Boulevard Project Engineering Drawings
- **Appendix 8:** Project Management Plan for I-81
- **Appendix 9:** EA and FONSI for I-81
- **Appendix 10:** Halfway Boulevard Environmental Documentation
- **Appendix 11:** Letters of Financial Commitment
- **Appendix 12:** Letters of Support



Washington County

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